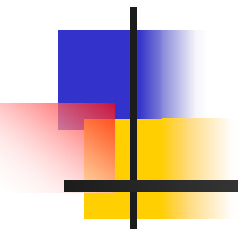


Controls Hardware Plans

Brian Oerter

Overall system comments

- More than 5000 modules and assemblies and chassis are installed
- Many had no failures
- Observed MTBF of individual assemblies exceeded 500,000 hours

VME Chassis

- 127 chassis installed in RHIC
- 13 chassis replaced during this run
  - 10 PS failures during run
    - Observed MTBF is ~185,000 hours
    - This meets mfg spec of 21 years
    - CAS is trained to replace chassis to reduce response time
    - New chassis have field replaceable power supply
  - 1 Fuse holder
    - All fuse holders for defective lot will be replaced
  - Two instances of loose wiring to AC fail module

VME chassis (con't)

- Improve airflow to chassis
- Mount filters on outside for easy replacement
- Recommend working with groups to shut off front end equipment where possible.

Waveform generator (V115)

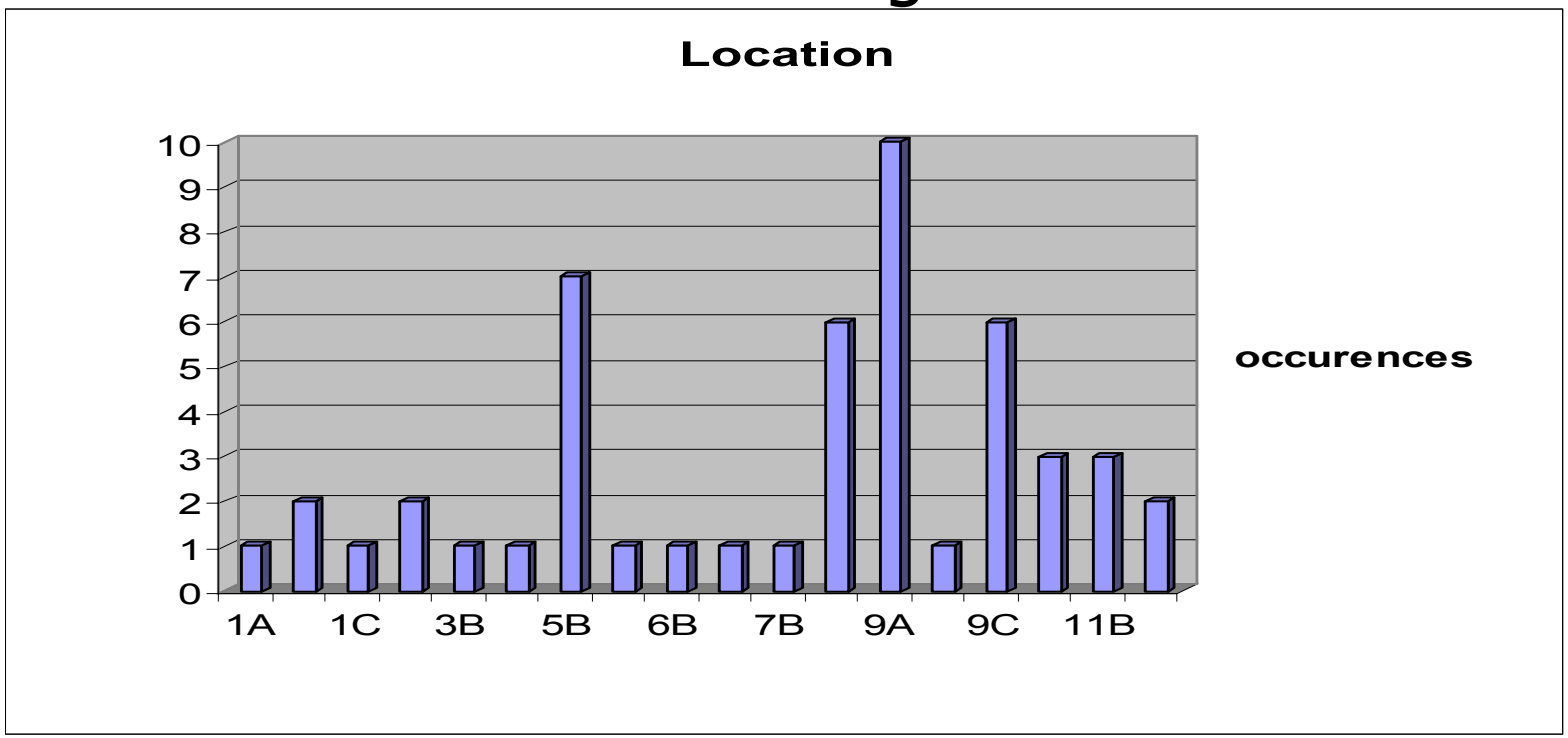
- 565 installed in RHIC
- 9 replaced during the run
  - 4 failed due to incorrectly installed capacitor
  - 1 crystal failed
  - 4 tested OK in lab
- All V115s will be reworked to correct capacitor problem

MADC (V114)

- A temperature compensated ADC has been tested
- Drift improved by a factor of four
- New ADCs will have compensation
- Existing spares will be reworked
- Temperature compensated units will be installed in service buildings

Alcove radiation

- Momentum PLCs affected
  - Move to service buildings



Radiation (con't)

- WFGs
  - Considered moving to service buildings
  - Cost ~ $750,000 (space problems, too)
- Front end processors
  - Existing processors don't have ECM
- No observed damage to fiber optic cables

Misc

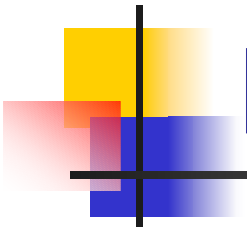
- RTDL
  - Increase capability to 128 frames
  - New 8 channel input module
  - Switch WFG inputs to shielded twisted pair
- Add a chassis and MADC in service buildings
  - Blue Yellow separation
  - Reduce congestion in chassis

Beam Permit Modifications

- Present design requires bringing up quench links before permit
- Quench inputs are not maskable
- Change requested would allow establishing permit without quench inputs or carriers active

Legacy systems

- We still have 76 Multibus systems in use
- Some are more than 17 years old
- Multibus systems are more difficult to diagnose – longer down time
- Many components are obsolete
- At the present retirement rate, we will not replace all multibus equipment in ten years



Legacy systems (con't)

- Booster BTA Instrumentation
- Booster LTB Instrumentation
- HITL RS232 Vacuum Controllers
- Booster RS232 Vacuum Controllers